

INVISIBLE DOORWAY: HOPE AS A TECHNOLOGICAL VIRTUE

by Donald W. Shriver, Jr.

As preface to what follows, a personal word seems appropriate. I am an ethicist by trade, but, in fact, over the past six or eight years, I have been a sort of intellectual gypsy. My work has taken me down strange halls of the university filled with the odors of formaldehyde, into concrete caverns inhabited by beasts of technology as large as nuclear reactors and as small as plasma beams. It has flung me into the company of students of engineering whose slide rules joggle at their belts and whose minds buzz with mathematical formulae that I will never understand. In it all, I have had to confess my sense of being a kindred spirit to Sir Geoffrey Vickers, who begins his book, *The Art of Judgment*, saying that he has borrowed knowledge from so many other disciplines during his life that he feels like the dogs who "eat of the crumbs which fall from the rich man's table; and in these days," he adds, "when the rich in knowledge eat such specialized food at such separate tables, only the dogs have a chance of a balanced diet."¹

So, in quest of a balanced diet, this particular ethicist has consorted in recent years with scientists, engineers, and their like in the

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universities of North Carolina. From them I have learned more than I have taught in return. Indeed, for ethicists and other humanists, it is hard to make the books balance in that respect. The physicist will always be able to teach me something about his subject. I may not be able to add to his knowledge of ethics at all: in some realms of his ethical consciousness, he may be able to add much to my own. Aristotle knew the dilemma well: it is hard, he said, for any man to be accounted an expert in ethics, for all men think they know something about the subject. Indeed they do, and ethicists must be ready to accept the unequal terms of that trade; for, though few physicists wish for a world in which all men are physicists, every ethicist must wish for a world in which all are ethical.

What then can he contribute to a discussion of the future of a human civilization which is increasingly freighted with the blessings and the burdens of science and technology? Not, I think, a pontifical definition of the "human values" which should be joined to the "technology" of our time. Socrates had a better system, whereby he encouraged men from many walks of life to reflect on the values which they did in fact affirm without always being conscious of them. Having raised their *consciousness* of their values, Socrates was content to have assisted his colleagues in defining the terms of the choice between values. That is all that I want to do here; for, not only is the maieutic method an honorable tradition in ethics, but the more I company with scientists and engineers the more I feel confident that we are together the creators of our much-needed "guiding vision of a desirable future." The phrase is Dennis Gabor's—from a book he wrote in 1963. In that book he calls upon the "clerks"—the writers and philosophers of our time—to get their heads out of the sands of the past and to point out a way into the future that differs from the past."² I am all sympathy for that exhortation; but I am even more sympathetic to the project of some joint discerning of that "guiding vision." That is my one last confession in this personal preface: that few of the questions which challenge my thinking now as a twentieth-century man are questions which I can answer on the basis of my thinking alone. All the important questions call for colleague-ship among the specialists. All of us, when we are honest about the matter, are hungry for a balanced diet.

TECHNOLOGY: PRODUCT OF MAN'S DEXTERITY AND HIS VALUES

My fundamental thesis is that, however the content of the "hope" may vary from time to time and from technology to technology, hope is a "technological virtue," inevitably and unavoidably so. This is to say that there is a guiding vision or value, in every technology as

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well as in every human response to technology; it is also to assume a certain definition of “technology” as *the intersection of limit and possibility in the conditions of human life and as the product of man’s dexterity and his hopes*. In defining technology, there is no separating of all this; there is only the variety of ways of describing the interrelation of it all.

The point is worth dwelling on at some length at the beginning; for it is a point frequently dismissed by many of my colleagues both in the liberal arts and in the sciences. It is a point less often dismissed by my colleagues in the technologies, for they know that they are up against questions of value every time they are up against a machine. In our culture it is easy for a scientist to accept the phrase “science *and* human values.” It is easy for him to forget that the quest for knowledge presupposes something valuable to human beings. Science rests logically upon that value. So at least on the matter of the value of knowledge, one must speak of “the human value in science.” But if that is the case with science, how much more is it the same case with technology. Bertrand Russell had hold of some truth when he said, “Whatever else is mechanical, values are not.” But the remark was libelous of machinery. A flipped-over version of Russell’s remark would be the analysis that philosophers probably need more to hear: Whatever else is valueless, machines are not. Take any technological object in history – take the hominid’s club flipped into the air at the beginning of Stanley Kubrick’s *2001* or the rocket ship it so gracefully becomes and ask yourself what either object *is* apart from some human intention, some human use, some human aspiration. I would not want to describe so much as a pencil apart from such reference: How totally mixed up is pencilness with the human hand physically and with the human brain conceptually. Hand and brain together make lines on a surface, and we call the lines language. In that relational context, what a piece of work is a pencil! “In form and moving, how express and admirable.”³ My apologies to Shakespeare; but anyone in a mood with Hamlet to marvel at “the paragon of animals,” might as well marvel at the tools of this paragon, too; for the nature of the man-the-fabricator is as mixed up in his fabrications as is the baking powder in a cake. (“Fabricator” was the Latin for it; but the Greeks said *poietaes*, “the maker, the poet.” Who is to say that the poets and the engineers are necessarily and inherently two sorts of men?)

One of the men who over the years has succeeded in putting such wild thoughts in my head is a department chairman in the Engineering School at North Carolina State University. Soon after I first met him, I walked into his office and noticed a certain gadget on his

desk. "What's that?" I asked. "Well," he said shyly, "that's my toy." "Hummm," said I. "What do you play with your toy?" With a twinkle he replied, "It's a gyroscope. Every now and then I take a minute or two off to twirl it around. When by the hour faculty have been complaining about the students and the students about the faculty, and the dean has been on the phone all day, I just turn to this gadget: I think of the mathematics that went into its design, and how it will keep a satellite in orbit around the earth for a thousand years. For a while, at least, it takes my mind off my troubles!"

With a touch of mischief, I asked him: "Would they use the same sort of gyroscope for guiding missiles?"

"Yes indeed," he replied with a frown fitting across his face. "You know, as an educator, nothing worries me more than that. Here we are teaching students the mathematics that will put men on the moon by 1970; but I know that the same mathematics will enable our students to build the technology that can blow us all up."

As I reflect on the integrity and the sensitivity embodied in those brief comments by my engineering colleague, I see struggling in him a scientific consciousness interlaced with an engineering consciousness—or what might as well be called a poetic consciousness interlaced with a political consciousness. On the one side, the speculative, beautiful comfort of Newtonian dynamics, abstractly lovely; on the other side, those dynamics embodied in a rocket carrying men to the moon and in a rocket carrying explosives from one human community to another. It was the difference between those two rockets that worried him, worried him so deeply that it is no overstatement to say that for him (existentially, as some philosophers would say) a rocket bound for the moon and a rocket bound for Moscow were profoundly foreign to each other—foreign in what they are designed to achieve; foreign in structured political intent; literally different in their aim; and therefore different in what they concretely are.

To begin to put it that way is to affirm a certain technical philosophical theory about relationships. Philosophers have long debated the question of whether what a thing is related to is "internal" or "external" to what that thing is. Werner Von Braun was assuming the theory of the externality of technological relationships when he made his famous remark after World War II that the only trouble with the German V-2 rockets, which he helped design, was that they landed on the wrong planet. In his mind, there was a regrettable but incidental difference between a rocket aimed at London and one aimed at the moon. Following that logic, one can go on to make statements, heard often around engineering schools, like: "Tech-

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nology is neither good nor bad in itself; everything depends on how it is used"; or, "Engineers cannot be blamed for the misuse of their technology; we only make the machines; the politicians and businessmen take them over." Listen for that logic over in the liberal arts school, and you are likely to hear phrases like "mere machines," and "mere hardware."

Now the debate between those who see human values as external to technology and those who see them as internal is not likely to be settled anytime soon. But I want to take sides in that debate—with the internalists. Like any sharp object, some pencils can be used to stab a man to death; but is it not an insult to pencilhood to define the thing in the first instance as a weapon? A pencil used as a dagger becomes a dagger; and if the art of writing were so completely forgotten in human culture that no one could think of a better use of a pencil, then pencilhood would have dropped out of our life, or would become simply an antique concept.

Perhaps that is pushing the pencil point too far! But for me and my engineering colleague, there are qualitative, internal differences between the gyroscope in its moon-exploration setting and the gyroscope in its Moscow-obliviation setting. These are the same qualitative differences that obtain between man the lover and man the murderer. At some important level of defining the two, we make them different creatures.

MULTIPLICITY OF VALUES IN TECHNOLOGY

But thereby hangs a great perplexing problem, already well above the horizon of most readers' minds. The definitional sum of it all so far is that technologies come "equipped" with values from the minds of the designers that are now in the substance of the design. One might say: Every technology is the child of some human hope, some intention, some purpose embraced by a person or a society. But descriptive and practical problems arise when we begin to recognize the strange multiplicity and mixture of hopes, intentions, and values that seem to creep into every technical system in history, once it is loosed from its inventor's brain, and even while it is still in its inventor's brain. Kenneth Boulding put it very well when he said: "The hens of value produced the eggs of technology; the eggs of technology the hens of value, in an ever-increasing, ever-expanding process of increasing complexity."⁴ We know from experience that once loosed in history everything human seems to suffer the impact of relationships hardly imagined by the original designers. The case is not much different with any of the other great inventions of

human history—political inventions, economic inventions, religious inventions. “Liberty, what crimes are committed in thy name!” History has made a shambles of what all the great designers intended. The past is littered with the unintended consequences of their inventiveness; and if the illustrations are easier to find in the area of technology, that is because in recent years we have become a technological society, which expresses so many of its hopes, so many of its conflicting values in some variety of hardware. The illustrations are easy to multiply from recent memory: Henry Ford sells America on the family car as the ultimate in personal mobility, but by the 1960s cars have brought on their own double Waterloo by immobilizing cities and polluting their air. The airplane that breaks the shackles of locality beyond the dreams of Daedalus and Icarus circles for an hour around Chicago, waiting for a place to land. The telephone that puts one person in instant communication with the whole earth rings at odd hours like an aggressive intruder or like “sweet bells jangled out of tune,” a mixture of blessing and curse.

The art of patiently dealing with mixed blessings has never been highly developed among men. Recent public discussion of the human value of technology gives abundant confirmation of that. Americans do not like ambiguities: they must love something or hate something. So we get the public’s love-hate relationships with science and technology. The hate side of the swing is now at full tilt. Certainly many younger Americans, like the ones we meet in classrooms around the university, are “down” on technology. Having been told during their high school days in the sixties that science and technology are our wings into the future, they have glimpsed images of that future in the devastation of Vietnam and in the pollution of the industrial city. They do not like that kind of future, and they are more than ready to find a scapegoat in the nearest school of engineering. Scapegoating, of course, is inherently unjust; but it is an ancient human tendency—the response of persons who share responsibility for an evil but who want to unload their share of it onto someone else’s shoulders. It is also the response of those who are too anxious to probe the mystery of the evil in the good men do and the good in the evil. Such anxiety probably stirs in the minds of us all, scientists, technologists, and humanists alike. What a haunting thing it is to remember that at the Bern Peace Conference of 1892 Alfred Nobel remarked to a leader of the conference, “My factories may end war sooner than your congresses. The day when two armies can destroy each other in a second, all civilized nations will recoil from war and disband their armies.”⁵ And the perplexity of it is that we

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still do not know if he will be proven right or wrong! Robert Oppenheimer may have cherished the same hope: according to one student of his career, there was for Oppenheimer at one point a "higher purpose" to the design of the hydrogen bomb, the purpose of "shaking mankind free from parochialism or war."⁶ It is easy to scoff at Nobel or at Oppenheimer for the political hopes they vested in dynamite and in nuclear bombs respectively; but basically the thing is still so "iffy." The sum total of the modern technological project is shot through with hopes and fears. We have good reasons from experience for hope, good reasons from experience for despair. Perhaps major war between Russia and America has in fact been avoided so far because of the bomb. But who knows if that avoidance can be counted on for the future? It is a mind-boggling ambiguity—enough to shrivel intelligence, or to afflict it with a shudder.

Nowadays, the merest child is a thoroughgoing participant in that ambiguity. About three years ago my eight-year-old son and I were watching a documentary on television. There flashed across the screen the image of an exploding hydrogen bomb. After a pause, he said, almost to himself, "I hope I grow up to be an adult." With only pretended casualness I asked: "Do you think you will?" Said he: "I'm not sure I will." (For all I know it was the sad duplicate of a conversation carried on around the campfire of some caveman father and son, staring at the dark, listening to the cry of a hungry lion, and wondering together if either one would live to see tomorrow. Only for us there is the extra anxiety of knowing that some of the hungriest of lions that may crouch in our own futures are the creatures of our own hands.)

It is here that questions of description begin to verge on questions of decision and practice. How a man perceives his present situation will always affect what he thinks he must do and can do in that situation. And if I have focused here on the mixture of blessings in the technological enterprise and on the ambiguities of good and evil in almost every great human enterprise, that tells something about the condition—even the distortions—of my own perceiving apparatus. Here I make no secret of siding with Michael Polanyi in believing that no man apprehends facts apart from some lenses of value; and I side with the pragmatists who believe that what a man knows is in constant interaction with what he thinks he must do. Some may see reasons for bright optimism in our current social situation; some may see reasons for dark despair. I am sensitive to the glints and shadows on both sides; and from the ambiguity and

mixture I see no release. Neither Pollyanna nor Cassandra makes me her disciple here. The one offers buoyant optimism on the basis of hope for good as an immovable human disposition that brushes aside both facts and the decisions by which men make their future; the other preaches pessimism on the basis of extrapolations from present facts into a future believed to be as certain as a computer calculation. The one offers us a rainbow bridge into a rosy future; the other, a concrete highway to disaster. Each of these stances towards the future is much too simple to be real. They are too simple to meet the realities of human experience. When man pushes open that invisible gate that swings into his own future, he usually counts on something more substantial than a rainbow; and he seldom has anything so solid as concrete on the other side. What does he have? To borrow and reinterpret a phrase from the laboratory, what he has is the experimental method.

According to the experimentalists themselves, all experiments are complex combinations of some hoped-for result and some dynamic conditions that will either yield that result, or yield other results that in turn shape the hope projected for the next experiment. Herein the experimentalist is an idealist and a realist at one and the same time. If he is a scientist, he believes that nature, which is stingy with its secrets, will give them up when cleverly tantalized; but he is ready himself to be tantalized into changing his ideas of what secrets are worth uncovering. If he is a technologist, he hopes he can make some energy serve the useful end he has in view; but in the process of bending it to his will, a new end may swim into his view, and the whole project go off in another direction. If he is an artist, he puts his hand to the medium to see what he will make of it and what it will make of him: Hardly a poem, hardly a symphony, hardly a novel comes out in the end to look just like the vision from which it had its initial impetus. But it would have had no impetus for beginning at all without the initial vision.

Since I understand prose writing a little better than any other of these activities, perhaps I can best express the courage and wisdom of experimentalism in extending that illustration to the creation of a prose story. Are we not in the position of a novelist who is making up some of the plot of his story as he writes, knowing full well that the page he now writes is making input into pages yet to come. The already-written story, so to speak, is the virtual author of scattered phantom paragraphs fifty pages away. Every word on some character's lips now preempts space down the way. But undetermined ranges of space are still quite open; and the actual writer of the story

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is saddled with the baffling business of writing towards a climax whose content even he does not know for sure.

So from that cybernetic bind of ambiguity regarding the future, all human action seems to be caught, or so our experience seems to say. And in that misty mixture of certainty, uncertainty, probability, possibility, and ignorance, there resides so much anxiety for even the wisest of us, that one wants to clamber out of all this mist back to some reassuring peak of rational clarity. The position promoted here will be called "obscurantism" by some because it contends that even technological man must deal with the future in terms of finite, limited experience. It is a radically different position from that of the author of a recent book, *Optimism One*, who bravely asserts his credo: "As revolutionaries in a rapidly expanding world, we concede nothing, accept no despair, believe in no ultimate mysteries, abide by no absolute truths, adhere to no eternal values, to no ultimate goals, consider no human problems irreversible, nothing unattainable."⁷ That is not an expression of the experimental method for dealing with the future, because every experimentalist I have known concedes a lot to his own and his material's limitations. He does not act as if everything that enters his head is attainable. What does ecological wisdom tell us these days if not this? But the ecologists at their best are not obscurantists. One of them from the University of Pennsylvania recently said that we know only about 10 percent of what we need to know in order properly to assess and regulate man's current trifling with the ecosystem. But that 10 percent is our early warning system, our protection against the disaster of total ignorance of the future towards which our social inertias might be taking us. As cyberneticists remind us, a little energy applied at the right point in a system may turn the whole thing around. There is some hope for us in that.

A convenient way to summarize that is to say that man's forethought is never so adequate as to permit him to dispense with the wisdom of afterthought and his afterthought is never so wise as to permit him to dispense with the risk of forethought. The Greeks had a nice pair of myths about that. We are all familiar with both myths, but we often forget that they composed part of one story—the story of Prometheus and Epimetheus. The Greek names meant forethought and afterthought. The two Titans were brothers. In the myth, Prometheus wishes to grace the earth with a species of creature who will share the very powers of the gods; so he creates man. In order to be sure that men participate in the divine, he seizes from Zeus the secret of technology—fire. But immediately it be-

comes a political question, a question of altered balances of power among Zeus, Prometheus, and the new human creatures. So from the side of Olympus, Prometheus gets his put-down; and men get their punishment, too. In that male-chauvinist age, where even the mythmaking imagination was gripped solidly in the clamps of sexism, man's punishment is woman. Epimetheus gets a wife, whose name is Pandora. If Prometheus was the first engineer, then Pandora is the first scientist. Curiosity is her virtue; she cannot abide to be ignorant of *anything*. Down comes Mercury, silently lugging the famous box. Epimetheus wants her not to open it; the afterthinker has already had enough experience with Zeus to distrust his gifts. But, of course, she opens it, and out come "the thousand natural shocks that flesh and blood are heir to," the legacy of technology, if you will, competing now with its promise. Now the afterthinker must cope with the dreadful mix of blessing and curse in the chain of events set in motion by his brother, the forethinker. The feedback has begun; and never again will a wise engineer kick open a door into the future with technological bravado, without asking himself if that door is the lid of a Pandora's box. It was in this sense that Alfred Nobel's word before the Bern Conference was not the word of a wise engineer. If he had lived to see the beginning of World War I, he might have had the afterthought of that engineer-colonel in *The Bridge over the River Kwai*: "What have I done?" It was the same afterthought that descended like a great weight into the mind of Robert Oppenheimer in the early fifties.

What then? In the name of the wisdom of myth or experience, abort the whole technological project? No, according to the myth there is still a way forward. Together Epimetheus and Pandora almost do not let the final, fragile creature out: in bad times, it is fashionable to settle down and live with evil by adopting a comfortable pessimism. But Zeus was belatedly kind: his vengeful brew, meant to shatter the power of newly technological man, contained the tiny gift of hope.⁸

It is about the status, the grounds, and the content of hope in a technological society that these pages are fundamentally concerned. To repeat: I am a pragmatist and not a mere optimist on the subject of hope as a technological virtue. Pragmatism neither dispenses with ideals nor affirms them unconditionally. It does not presuppose which of our problems we can or cannot solve until efforts have been made to solve them. Pragmatism does call for the efforts, thus presupposing the attitude of hopefulness. But it permits a man to revise his hope in the light of new experience and to adventure new

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experience for himself under the pressure of that newly revised hope. "Cabined, cribbed, and confined" by where we are in a history of which we are not the present authors; beckoned to write in the still-open spaces of a future narrative of which we are partly the authors; no discharge from the exasperating, demanding interface between limitation and possibility!

That is the formal shape of the matter. We are inhabitants of a feedback system. We willed to have it so when we accepted fire from the gods or from our own ancestors' interchange with their environment. Nothing in their or our experience suggests that the steering of the human ship is ours to redirect altogether; but woe be to us if we do not redirect it as the present messages of wind, wave, and star direct. Double woe to us, if we simply take our hands off the wheel!

It adds up to a pair of formal rules regarding the anatomy of hope in a technological society: *We are obligated to hope for the best, but obligated as well to subject our definitions of "best" to the scrutiny of our experience.*

GETTING CLEAR OUR CENTRAL PRIORITY AMONG VALUES

The trail from these high generalities leads to a simple question to which, in my view, there must be some concrete answer. As of 1972 A.D., what is the best we must hope for? The question is as appropriate and as shattering for both the scientist and the ethicist as was the similar question leveled at Loren Eiseley at the end of one of his classroom lectures by a student at the back of the room. Eiseley had been talking about the long, sinuous trail of the evolution of species upon this planet. Like that thin cry of hope inside Pandora's box, the student with raised hand inquired, "Doctor, do you believe there is a direction to evolution?"⁹ It was the question that the evolutionists of Darwin's time had almost delighted to answer with a "no" that had set the ears of theologians burning. The evolution of species is a fight whose winner cannot be predicted in advance—the shape of whose next stage cannot be assured before the fact. But, says Eiseley, the great evolution champions of the last century, the great theologian slayers, granted themselves one little luxury that ordinary men cannot forever afford: a retreat from that decision situation in which men give practical answers to the question: "Is there a direction?" For practical purposes, some direction in the course of human events has to be assumed, or the ship is sure to flounder. It may be a temporary direction, a revisable direction; but once the wheel is in your hands there is no discharge from the decision to point the prow somewhere.

I confess that it is relatively easy to arrive at this point in such an analysis, and relatively hard to keep on going. Ultimate-type questions are rearing over the horizon—questions like which star one will consider north star or guiding vision for his adventure into the future; and it is not the tradition in academic analyses for one person to tell another what his choice in such matters should be. It is not even the custom for the academic to say what his choice is. This latter tradition is the one that Eiseley was being asked to break. It is a tradition, to my own mind, long overdue to be broken.

The question, mind you, is not “For what might we hope?” The question is, “For what must we hope as our very best hope out of all our other hopes?” It is a matter of getting clear our central priority. Surely one of the confusions that technology has introduced into the realm of our values is that it has enabled us to realize so many values that in a previous age were literally unimaginable. Speed of transport and speed of communication, to name only two examples, have enabled individuals and groups of men to multiply their relationships with one another and gain benefits from one another that a century ago hardly anyone but the Jules Vernes even speculated about. No longer is the phrase “asking for the moon” a valid metaphor for “asking for the impossible.” We asked for the moon; and we got it! (Emerson put it very well: “Be careful what you want; you may get it!”) We have gotten hundreds of our wants, to be judged more or less profound, depending on one’s ultimate standards for measuring profundity. But that is the most vital matter of all: Amid the welter of our wishes that have now come true, how do we sort and rank them? How do we divide the better from the worst of them; and among our standards for judging better from the worse, what is our best of standards? When we wish our best wish, what is it?

Among living men who have thought deeply about this matter, none has thought more deeply than a student of human evolution already quoted here and to whom I personally owe much more than the half title of this paper: Loren Eiseley. Eiseley is that rare scientist—his tribe is increasing—who does not hesitate to tell us what he values the most and in what direction he hopes man’s future will most tend. If you have read one or two of his books, you know that the mind of this anthropologist is haunted by bits of data from the vast diggings of his colleagues in paleontology. One of these bits recurs three or four times in books of the last fifteen years. In *The Firmament of Time* he recounts it as follows:

Forty thousand years ago in the bleak uplands of southwestern Asia, a man, a Neanderthal man, once labeled by the Darwinian proponents of struggle

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as a ferocious ancestral beast—a man whose face might cause you some slight uneasiness if he sat beside you—a man of this sort existed with a fearful body handicap in that ice-age world. He had lost an arm. But still he lived and was cared for. Somebody, some group of human things, in a hard, violent and stony world, loved this maimed creature enough to cherish him. [Pp. 144-45]

That is a bit of data. Other colleagues in the field of study—Robert Ardrey, Desmond Morris, Konrad Lorenz—seize upon other data, interpret them differently, build their theories of human nature accordingly. But the theoretical dispute cannot be settled by data; it must be settled chiefly by a future whose nature has yet to be determined by ancient human nature as transmitted and modified through us. What we believe to be most worth promoting from our past will surely become our input into the future of “human nature.” In this sense, what men hope is always a self-confirming prophecy; and again the wisdom of Kurt Lewin will be proved, “Nothing is so practical as a good theory.”

Obviously, it makes a great deal of practical difference if we can go on to affirm or to deny Eiseley’s theory of man—a theory that is a compound of human fact and human wish, like all the great hopes which have moved men to decision. It is a theory advanced by him tentatively and almost shyly, with a touch of self-conscious vulnerability. What are we? “We are potential love animals.”¹⁰

Love: a hope that flits and flickers in the midst of all the other hopes which twentieth-century man’s technology so commodiously embodies. The great policy questions that loom before us on the social management and the social reshaping of our technology will involve us in the sorting out of these mixes and value priorities. We will have to face this complexity, grapple with it until we can dissect the good from the evil, and reconstruct the technological society accordingly. But that very grappling will be afflicted with so much confusion if we are not clear on at least one thing about human life to which we will give *highest* priority. Will that one thing be human life itself, human lives themselves, and all that sustains those lives? Will that one thing be the love of a neighbor for fellow creatures? Will ours be a compassionate society in which men (and other creatures!) will cherish one another, down to the least of them, a society that measures its own moral quality in terms of its care for the weakest, least prestigious of its members? It could be so hoped. It must be so hoped, to the minds of some of us alive in this very moment. Love is our hope for our future. It is what some of us have to say when we are pushed to take a position on the matter.

In a strangely appropriate way, it is right to express such a hope in the context of the casualties of a technological society just as Eiseley expressed it in the context of the casualties of that “violent and stony world” of old. Our reasons for cherishing the memory of our casualties are conceivably many. Consider, as a final example, the casualties of Apollo 1: Virgil Grissom, Roger Chaffee, and Ed White. In moon-exploratory terms, their deaths had some utilitarian meaning: for the fire that snuffed out their breath in a second was a warning to a group of engineers who long since, no doubt, have sought to protect future astronauts from that particular risk. But to value the death of Grissom, Chaffee, and White chiefly in terms of their inadvertent service to the safety of future Apollo missions would be to commit a colossal, not to say an obscene, moral error. At our best, we value no man chiefly in terms of his usefulness in helping the rest of us achieve our specific ends. *At our best, it is the man himself who is precious to us.* And we are so seldom at our best that the evidence that enables us to hope for our best remains fitful and flickering. The evidence was with us in another near-casualty of this country’s space exploration—in Apollo 13, whose pilots almost suffered a snuffing out of breath equivalent to that of Grissom, Chaffee, and White. But that crippled trio of spacemen brought out the best in millions of human beings on this planet. As Apollo 13 hobbled home, unsuccessful in its mission, as three oxygen-short human beings huddled in one little room of their spaceship, men of many nations around the home planet found their hearts beating a little faster. In many languages there must have been uttered—prayers. And there was much rejoicing when three lost men out of three billion were safe at last and home.

On a planet which every day sees the senseless death of thousands of humans from bombs and starvation, we are obviously a long way from the time when the race of men loves all its members as faithfully as on occasion it loves some of them. But the signs of the hope are here. Blessed is the technology which embodies and anticipates *that hope!*

NOTES

1. *The Art of Judgment: A Study of Policy Making* (New York: Basic Books, 1965), p. 11.
2. Dennis Gabor, *Inventing the Future* (London: Secker & Warburg, 1963), p. 182.
3. *Hamlet*, II, ii.
4. Kenneth Boulding, “The Interplay of Technology and Values,” in *Values and the*

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5. Nicholas Halasz, *Nobel* (New York: Orion Press, 1959), p. 241.

6. The words are ascribed to Nuell Pharr Davis, an Oppenheimer interpreter, by Robert Jay Lifton, "Prophetic Survivors: Hiroshima and Beyond," *Social Policy* (January/February 1972), p. 13.

7. F. M. Esfandiary, *Optimism One* (New York: Norton & Co., 1970), as quoted in a review article, "The Case for Optimism," by Wes Thomas and Jeremy Wiesen, *The Futurist* (April 1972), p. 69.

8. See H. A. Guerber, *Myths of Greece and Rome* (New York: American Book Co., 1893), pp. 25-35.

9. Eiseley, *The Firmament of Time* (New York: Atheneum Publishers, 1967), p. 167.

10. *Ibid.*, p. 146.